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GEOLOGIC APPLICATION
OF THERMAL INERTIA IMAGING
USING HCM DATA

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16. Abstract <p>During the July-September 1980 quarter of the JPL/HCMM Investigation the final tapes were received completing the order, and preliminary processing was done. Thermal inertia images for each of the three test sites, Death Valley and Pisgah Crater, California and Goldfield, Nevada were created using registered HCMM day/night pairs and the JPL model. A comprehensive study and analysis of the geologic application of all acquired HCMM data is now in progress.</p>					
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Introduction

The JPL/HQMM Investigation is a study of the feasibility of using thermal inertia, inferred from remotely sensed temperature data, to complement Landsat reflectivity data for reconnaissance geologic mapping and mineral exploration.

During the July - September, 1980 quarter of this investigation the remainder of the appropriate HQMM data tapes were received and cataloged. Selected HQMM day/night pairs were registered and the JPL Model, incorporating ground truth data, was run. These data were used to create thermal inertia images of the three test sites. Geologic analysis of these images and comparisons of aircraft and satellite data for each site are now in progress.

Accomplishments and Significant Results

The remainder of HQMM data tapes, ordered during previous quarters, have been received, logged and images created. All data needed for this investigation have now been received and cataloged (Table 1).

Registration of selected HQMM day/night pairs for each test site has been accomplished. The JPL Model, incorporating ground truth data acquired during the times of aircraft overflights and satellite overpasses, has been run for all the HQMM test sites for the days of interest. Using these data, thermal inertia images of the three test sites, Death Valley, California, Pisgah Crater, California and Goldfield, Nevada, were created. Preliminary geologic analysis of these images has now started and will be included in a comprehensive study of the geologic application of all acquired HQMM data.

Comparison of satellite and aircraft data, collected concurrently over each test site is now underway. It is obvious that much more information is available in the aircraft data owing to their much greater spatial resolution.

Presentation

Dr. John P. Schieldge presented a paper entitled "Use of Thermal Inertia Properties for Material Identification" at the 24th Annual Technical Symposium of the Society of Photo-Optical Instrumentation Engineers, July 28- August 1, 1980 in San Diego, California. The paper was co-authored by Anne M. Kahle, Ronald E. Alley and Alan R. Gillespie.

Program for Next Reporting Interval

During the next quarter, the production of thermal inertia images for all the test sites from the aircraft and satellite data will be completed. Geologic interpretation of all images will continue. Work on the JPL/HQMM Investigation Final Report will also begin during the next quarter.

Recommendations

None

Funds Expended

Expenditure for July - September, 1980: \$6,089.00

Conclusions

None

TABLE 1

DATA SETS BEING PROCESSED

Site	HQW SATELLITE	AIRCRAFT	SITE
Death Valley, California	5-14-78 5-30-78 7-6-78 7-17-78 7-22-78 8-18-78 9-19-78 4-4-79	6-76 3-77 2-78 3-78 4-79	Death Valley, California
Pisgah Crater, California	5-14-78 5-30-78 7-6-78 7-17-78 7-22-78 8-18-78 9-19-78 4-4-79	8-75 6-76 7-77	Pisgah Crater, California
Walker Lane, Nevada (Goldfield/Ralston)	5-14-78 5-30-78 7-6-78 7-17-78 7-22-78 8-18-78 9-19-78 4-4-79	6-76 10-76 8-77 8-78	Walker Lane, Nevada Goldfield
San Rafael Swell, Utah	8-28-78	10-76 8-77 8-78	Ralston
		5-77 5-77	Tintic, Utah Drum Mtns., Utah